



The Graduate Center of CUNY Ph.D.  
Program in Mathematics Course Syllabus

-Fall 2020

Course Title: Topics in Riemann Surfaces

Course #: 88100

Time and Location: Wed. 3:45-5:45

Instructor Name: Ara Basmajian

Contact Information: abasmajian@gc.cuny.edu

Pre-Requisites: \_\_\_\_\_

Office Hours: TBA

Description:

In the first few lectures we will discuss what a Riemann surface is from an algebraic, complex analytic, conformal, and geometric viewpoint. Subsequent lectures will focus on the geometry and topology of a Riemann surface. In particular, we will discuss

- 1) The topology of surfaces (finite and infinite type)
- 2) The Hyperbolic plane and its group of isometries. Classification of elements.
- 3) Hyperbolic surfaces and their invariants- Closed geodesics, intersection number, length of a closed geodesic,...
- 4) The Collar lemma and its various generalizations.

Time permitting we will talk about the geodesic flow on the unit tangent bundle, Teichmuller space, and various functions on the Teichmuller space. Along the way open problems and areas for further research will be mentioned.